

NAME:

DATE:

## Unit-2 Mastery Assessment (version 647)

### Question 1 (10 points)

Let  $f$  represent a function. If  $f[36] = 33$ , then there exists a knowable solution to the equation below.

$$y = \frac{f[3x + 6] + 45}{39}$$

Find the solution.

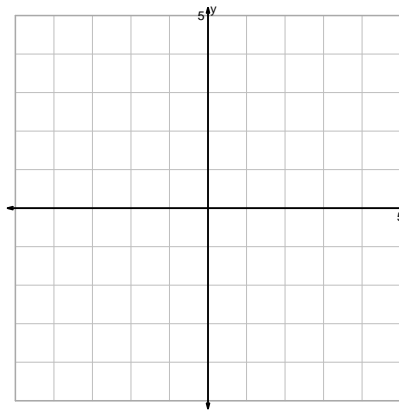
$$x =$$

$$y =$$

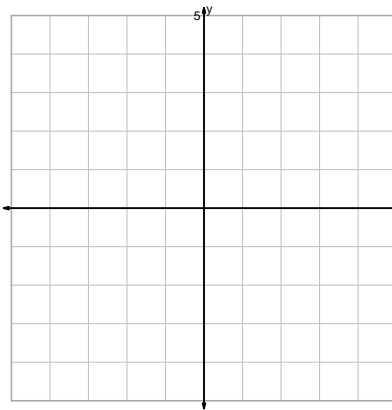
### Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

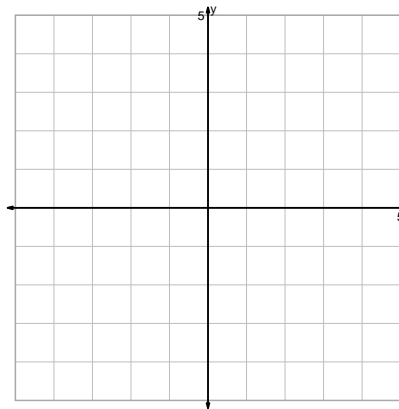
$$y = 2^{-x}$$



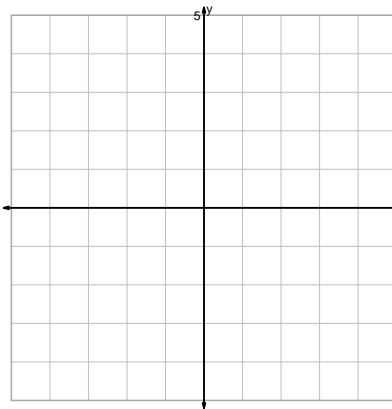
$$y = (2x)^3$$



$$y = 2 \cdot x^2$$

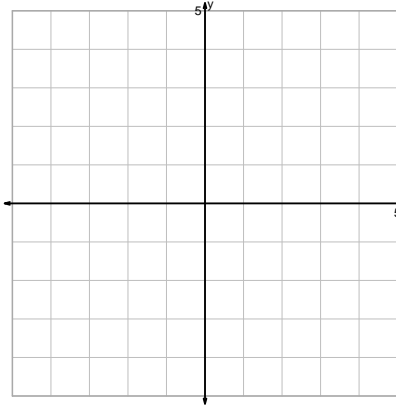


$$y = \left(\frac{x}{2}\right)^3$$

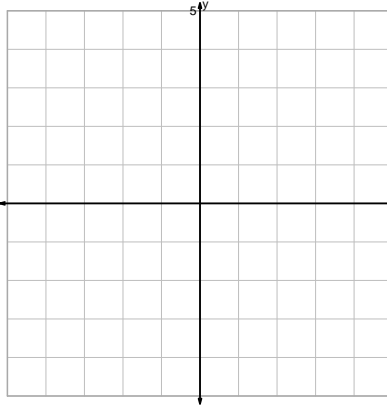


Question 2 continued...

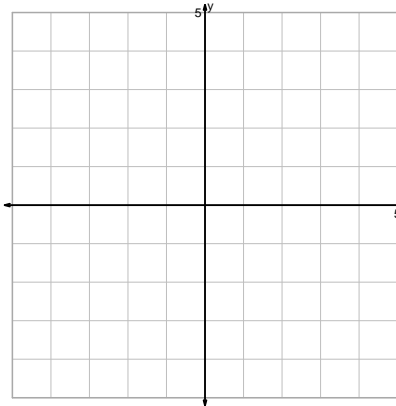
$$y = \sqrt{x+2}$$



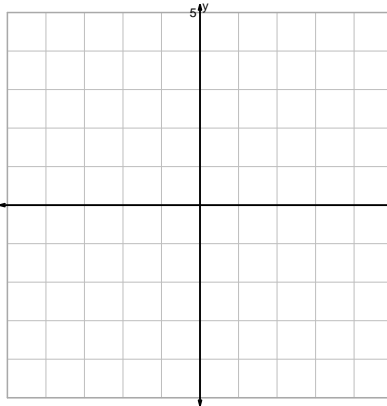
$$y = \log_2(x-2)$$



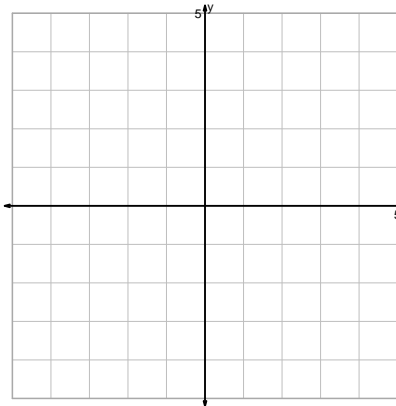
$$y = \sqrt[3]{x} - 2$$



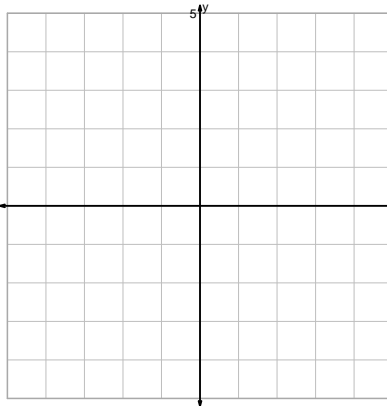
$$y = -\log_2(x)$$



$$y = \frac{2^x}{2}$$

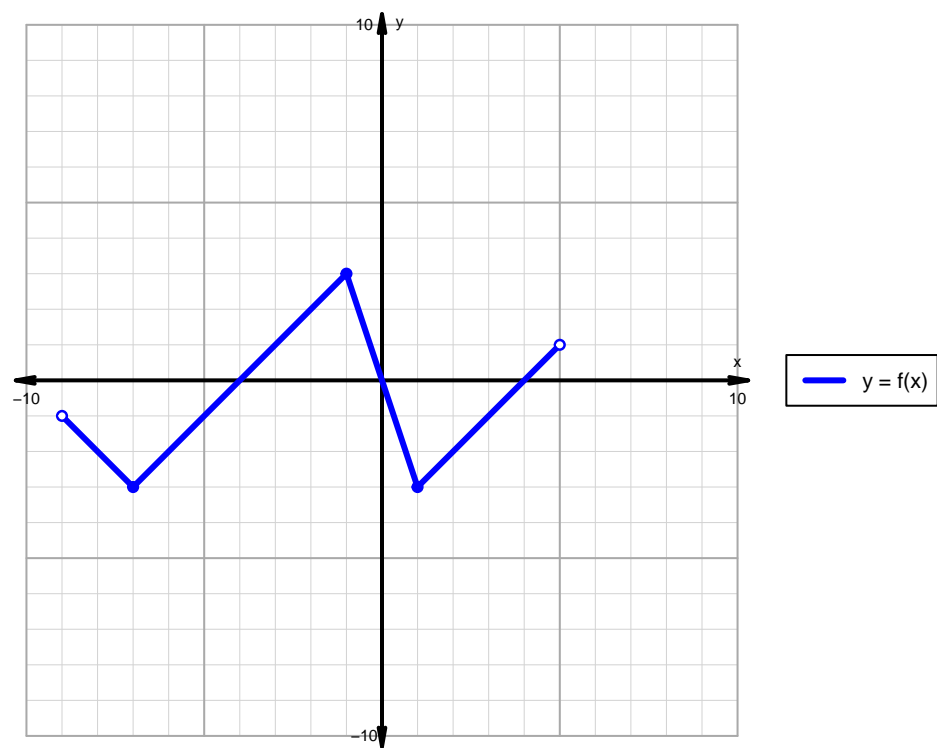


$$y = \sqrt[3]{x} + 2$$



Question 3 (20 points)

A function is graphed below.



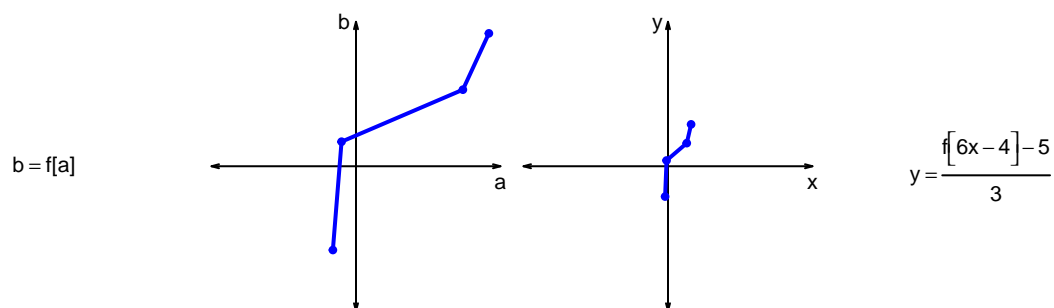
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

**Question 4 (20 points)**

Let  $f$  represent a function. The curves  $b = f[a]$  and  $y = \frac{f[6x-4]-5}{3}$  are represented below in a table and on graphs.

a	b	x	y
-16	-58	-2	-21
-10	17	-1	4
74	53	13	16
92	92	16	29



- a. Write formulas for calculating  $x$  from  $a$  and calculating  $y$  from  $b$ . (Or, write the coordinate transformation formula.)

- b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve  $y = f[x]$  into the second curve  $y = \frac{f[6x-4]-5}{3}$ ?

**Question 5 (10 points)**

A parent square-root function is transformed in the following ways:

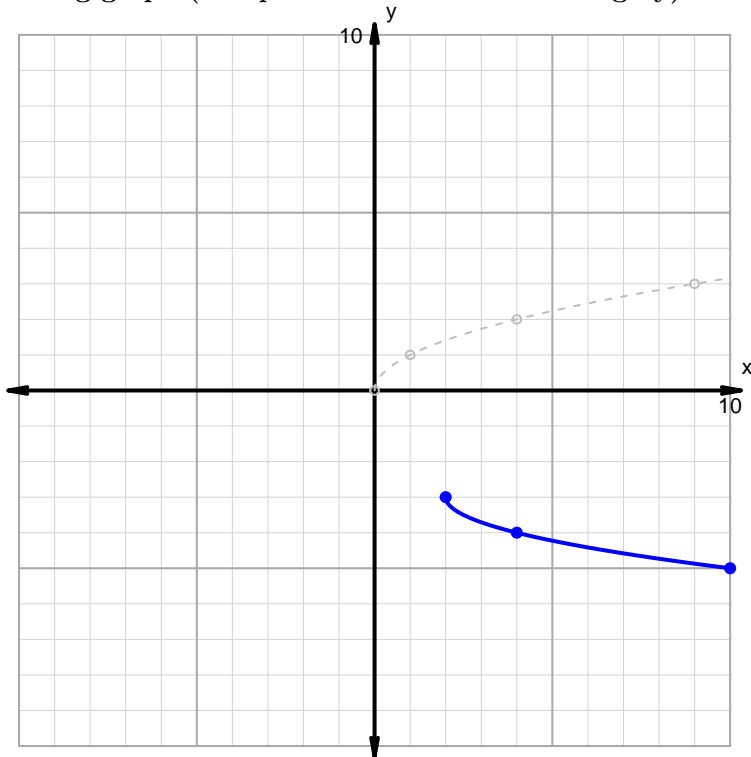
**Horizontal transformations**

1. Translate right by distance 1.
2. Horizontal stretch by factor 2.

**Vertical transformations**

1. Translate up by distance 3.
2. Vertical reflection over  $x$  axis.

**Resulting graph (and parent function in dashed grey):**

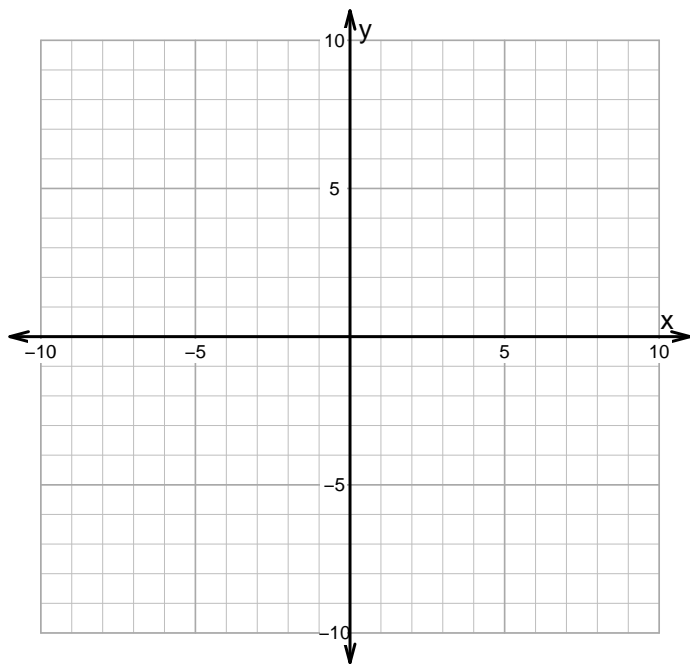


- What is the equation for the curve shown above?

**Question 6 (20 points)**

Make an accurate graph, and describe locations of features.

$$y = 2 \cdot |x + 3| - 4$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	